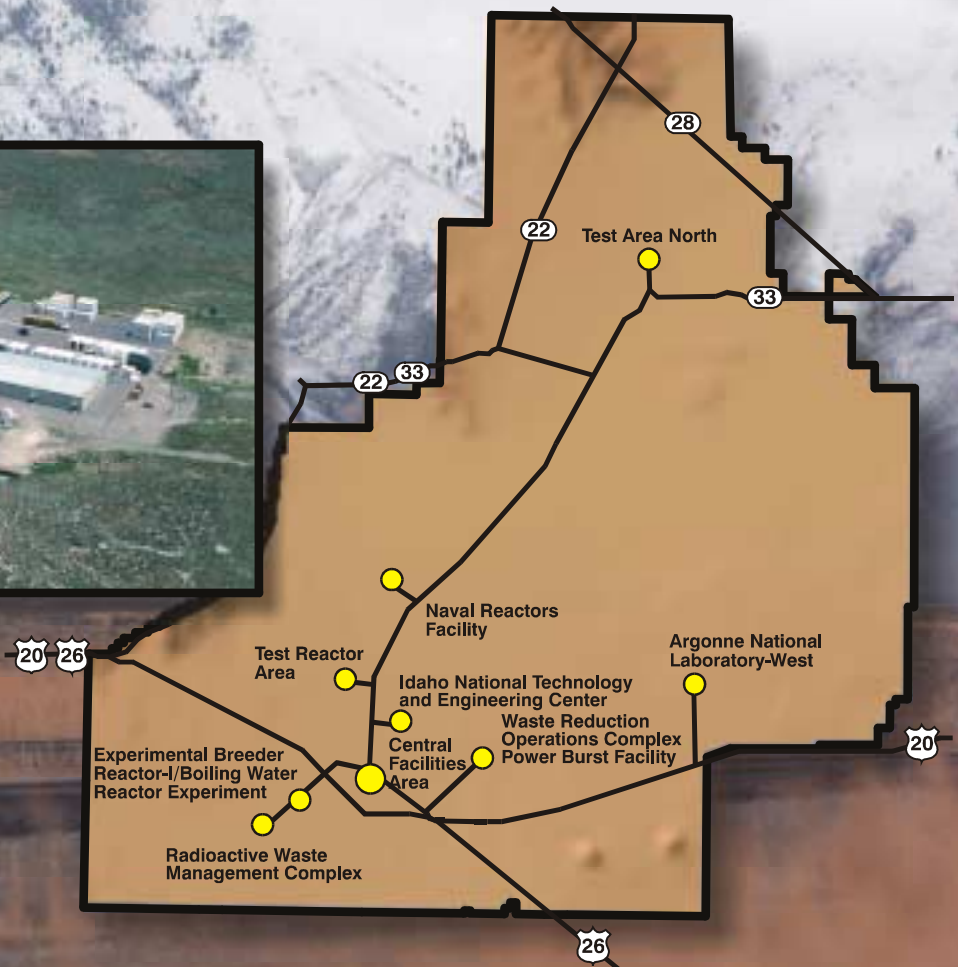


Application for a Title V Operating Permit for the Idaho National Engineering and Environmental Laboratory



Volume V Waste Reduction Operations Complex



INEEL

Idaho National Engineering and Environmental Laboratory

Home of Science
and Engineering Solutions

**Application for a Title V Operating Permit for the Idaho
National Engineering and Environmental Laboratory**

**Volume V
Waste Reduction Operations Complex**

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**Idaho National Engineering and Environmental Laboratory
Environmental Affairs
Bechtel BWXT Idaho, LLC
Idaho Falls, Idaho 83415**

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FOREWORD

Volume V is one of a total set of ten volumes prepared for the Application for a Title V Operating Permit for the Idaho National Engineering and Environmental Laboratory.

The volumes making up the INEEL operating permit application are numbered as follows.

Volume I	Sitewide Standards and Information, and Operating Permit Application Guide
Volume II	Argonne National Laboratory-West
Volume III	Central Facilities Area
Volume IV	Idaho Nuclear Technology and Engineering Center
Volume V	Waste Reduction Operations Complex
Volume VI	Naval Reactors Facility
Volume VII	Test Area North
Volume VIII	Test Reactor Area
Volume IX	Radioactive Waste Management Complex
Volume X ^a	Radioactive Waste Management Complex, Advanced Mixed Waste Treatment Project, is forthcoming.

This February 2001 application is an updated revision of the July 1995 application (INEL-95/0155, Rev. 1) written to include, but not limited to:

- Changes to the Idaho Administrative Procedures Act Air Regulation;
- Updating the name of the Idaho Chemical Processing Plant to Idaho Nuclear Technology and Engineering Center (Volume IV);
- Cessation of various programs; and
- Addition of Volume X (which is forthcoming) that reflects BNFL, Inc. as the operator for the Advanced Mixed Waste Treatment Project at the Radioactive Waste Management Complex.

a. Anticipated completion FY 2002 by BNFL, Inc.

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ACRONYMS

AEC	Atomic Energy Commission
AFBC	atmospheric fluidized bed combustion
AMWTF	Advanced Mixed Waste Treatment Facility
ANL-W	Argonne National Laboratory-West
ANSI	American National Standards Institute
AST	above-ground storage tank
ATR	Advanced Test Reactor
BBWI	Bechtel BWXT Idaho, LLC
BORAX	Boiling Water Reactor Experiment
BRC	below regulatory concern
CAM	continuous air monitor
CEMS	continuous emission monitoring system
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CSSF	Calcined Solids Storage Facility
CGS	Calcine Grinder Setup
COMS	continuous opacity monitoring system
CPP	Chemical Processing Plant (now known as INTEC)
CTF	Contained Test Facility (formerly LOFT)
DEQ	Department of Environmental Quality
DOE	Department of Energy
DOE-ID	Department of Energy-Idaho Operations Office
DOG	dissolver off-gas
DOP	dioctyl phthalate
DOT	Department of Transportation
DU	depleted uranium
DVF	Drum Venting Facility
ECF	Expanded Core Facility
EDE	effective dose equivalent
EIS	environmental impact statement
EPA	Environmental Protection Agency
ETR	Engineering Test Reactor
FAA	Federal Aviation Administration
FDP	Fluorinel Dissolution Process
FSA	Fuel Storage Area
HAP	hazardous air pollutant
HEPA	high-efficiency particulate air
HFEF	Hot Fuel Examination Facility (located at ANL-W)

HLLWE	high level liquid waste evaporator
HQ	headquarters
HVAC	heating, ventilation, and air conditioning
ICPP	Idaho Chemical Processing Plant (now known as INTEC)
IDAPA	Idaho Administrative Procedures Act
IET	Initial Engine Test
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
JP-4	jet propulsion 4
JP-8	jet propulsion 8
LET&D	Liquid Effluent Treatment and Disposal (Facility)
LLW	low-level radioactive waste
LOFT	Loss-of-fluid Test
M&O	management and operations
MCR	maximum continuous rating
MDF	Material Development Facility
MTR	Materials Test Reactor
MWSF	Mixed Waste storage Facility
NA	not applicable
NESHAP	National Emission Standards for Hazardous Air Pollutants
NRF	Naval Reactors Facility
NWCF	New Waste Calcining Facility
OCM	organic composite material
PBF	Power Burst Facility
PCS	petroleum-contaminated soil
PEW	process equipment waste
PM	particulate matter
PM-10	particulate matter with a diameter less than 10 μ
PREPP	Process Experimental Pilot Plant
PRF	Process Reclamation Facility
PSD	prevention of significant deterioration
PTC	permit to construct
RAL	Remote Analytical Laboratory
RAM	remote area monitor
RCRA	Resource Conservation and Recovery Act
RCT	radiation control technician
RDF	refuse-derived fuel
RE	Retrieval Enclosure
RESL	Radiological Environmental Sciences Laboratory
RFP	Rocky Flats Plant
RWMC	Radioactive Waste Management Complex
SAL	Special Analysis Laboratory

SDA	Subsurface Disposal Area
SES	Special Equipment Services
SMC	Specific Manufacturing Capability (Facility)
SPING	stack particulate, iodine, and noble gas
SRT	special response team
SWEPP	Stored Waste Examination Pilot Plant
TAN	Test Area North
TMI-2	Three Mile Island Unit 2
TRA	Test Reactor Area
TRAHC	Test Reactor Area Hot Cell
TRU	transuranic
TSA	Transuranic Storage Area
TSF	Technical Support Facility
TSP	total suspended particulates
U.S.C.	United States Code
UST	underground storage tanks
UTM	Universal Transverse Mercator
VMT	vehicle miles traveled
VOC	volatile organic compound
VOCNM	Volatile organic compound-non methane
VOG	vessel off-gas
WCF	Waste Calcining Facility
WERF	Waste Experimental Reduction Facility
WIPP	Waste Isolation Pilot Plant
WMF	Waste Management Facility
WROC	Waste Reduction Operations Complex
WRRTF	Water Reactor Research Test Facility
WSF	Waste Storage Facility
WWTF	Warm Waste Treatment Facilities

SYMBOLS AND ABBREVIATIONS

α	alpha
β	beta
β/γ	beta/gamma
Btu	British thermal unit
Ci	curie
Ci/mo	curie per month
Ci/yr	curie per year
Cm ²	square centimeters
CO	carbon monoxide
g	gram
gr	grain
hp	horse power
lb	pound
μm	micrometers (10^{-6} meters)
MBtu	million British thermal unit
mrem	thousandth of a roentgen equivalent man
NO _x	nitrogen oxide source
SO _x	sulfurous oxide source
v/v	volume per volume
w.c.	water column

1. AREA-SPECIFIC INFORMATION

1.1 Facility Description

The Waste Reduction Operations Complex (WROC) Area, [formerly known as Power Burst Facility (PBF)] located approximately six miles northeast of the CFA, was used for Special Power Excursion Reactor Tests (SPERT). The WROC area consists of five separate sites, which include the PBF Control Area and those areas associated with the SPERT I/PBF, SPERT II, SPERT III, and SPERT IV reactors. Figure V-1-1 shows the location of the WROC areas at the INEEL, and Figure V-1-2 shows the layout and physical location of the individual WROC areas.

The PBF Control Area is the central administrative area for the SPERT/PBF operations. The buildings at the control area house the old SPERT and PBF reactor controls, offices, maintenance and instrumentation areas, and the PBF reactor data center.

The SPERT I reactor was the first of the five reactors built in the WROC Area. The SPERT I reactor was decontaminated and decommissioned in 1964 and physically removed in 1985. In 1970, the PBF reactor was built north of the SPERT I reactor site. The PBF reactor was used for reactor tests on fuel behavior and used in a variety of operation conditions to obtain fuel rod behavior data. The SPERT I Area was renamed the PBF Reactor Area in 1989. The PBF reactor is currently being held in a shutdown status pending a new mission or inactivation.

The SPERT II Reactor Area, renamed the Waste Engineering Development Facility in 1986, was decontaminated and decommissioned in September 1980. The reactor equipment was removed during the decontamination. The SPERT II facilities were modified in 1986 for waste processing research and development. The Waste Engineering Development Facility is currently used for clean and contaminated lead storage, office space, and repackaging of surrogate waste.

The SPERT III Area Reactor consisted of several structures and the SPERT III Reactor Building. The reactor was designed to conduct studies on high-power, high-temperature, heterogeneous light water reactors. The reactor was placed in standby in 1968 and was decontaminated and decommissioned in 1980. The SPERT III Area is now the site of the Waste Experimental Reduction Facility (WERF).

The WERF area includes:

- The main WERF building (PER-609), which houses the waste incinerator, waste stabilization, and offices (incineration ceased November 2000)
- The sizing building (PER-622), which houses size reduction, compaction and mixed waste macroencapsulation operations
- The auxiliary building (PER-635), which originally housed size reduction operations, and is now used for equipment storage
- The WERF Waste Storage Building (PER-623), which is used for storing mixed waste and hazardous waste
- The WROC operations support building (PER-641), which, was recently constructed, and contains offices for support personnel

The SPERT IV reactor, renamed the Mixed Waste Storage Facility (MWSF) (PER-613), was decontaminated and decommissioned then reconfigured to the present operations in 1986. The facility was modified to store mixed waste and hazardous waste.

ANL-W Argonne National Laboratory–West
 CFA Central Facilities Area
 INTEC Idaho Nuclear Technology and Engineering Center
 NRF Naval Reactors Facility
 WROC Waste Reduction Operations Complex
 RWMC Radioactive Waste Management Complex
 TAN Test Area North
 TRA Test Reactor Area

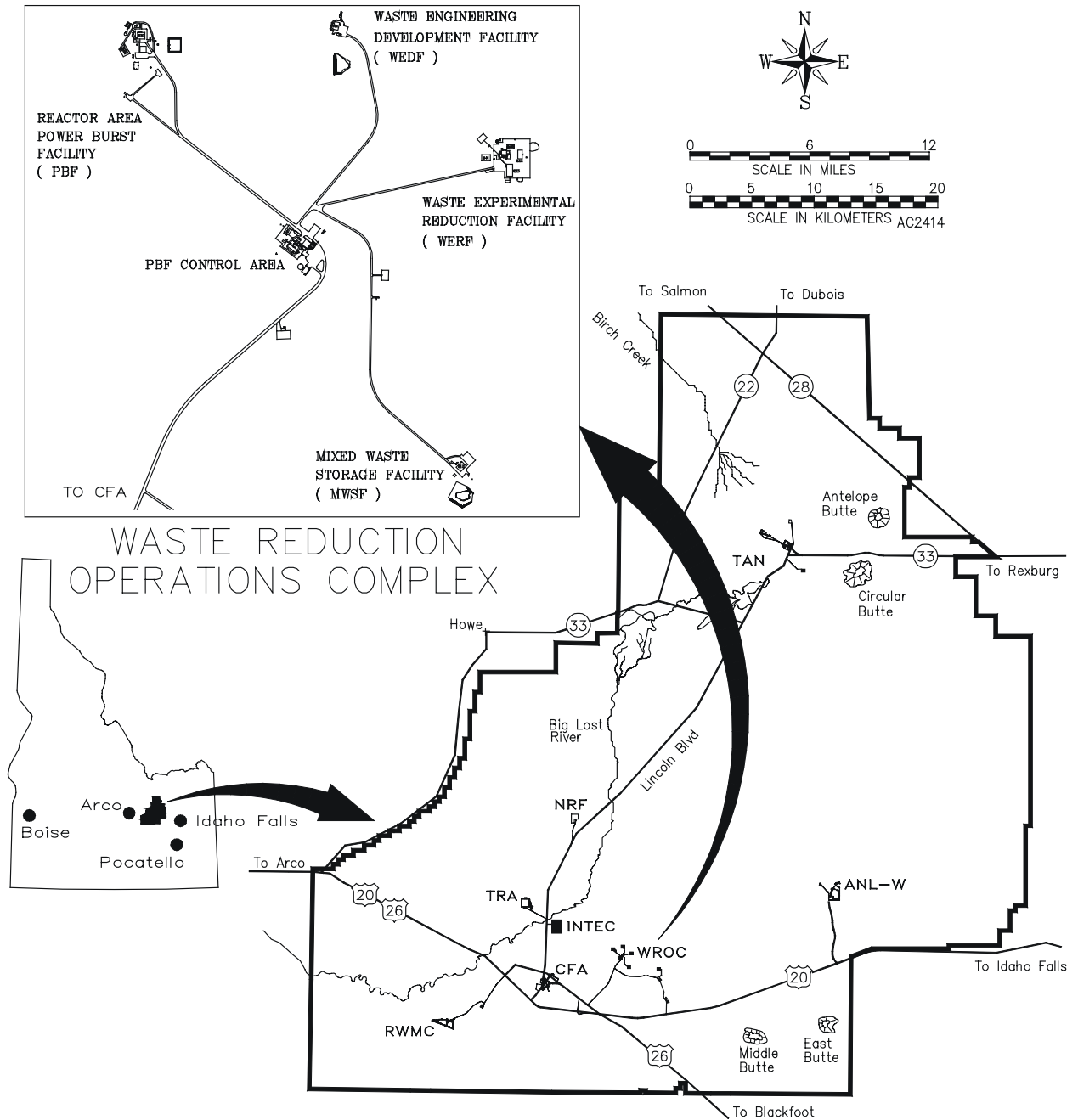
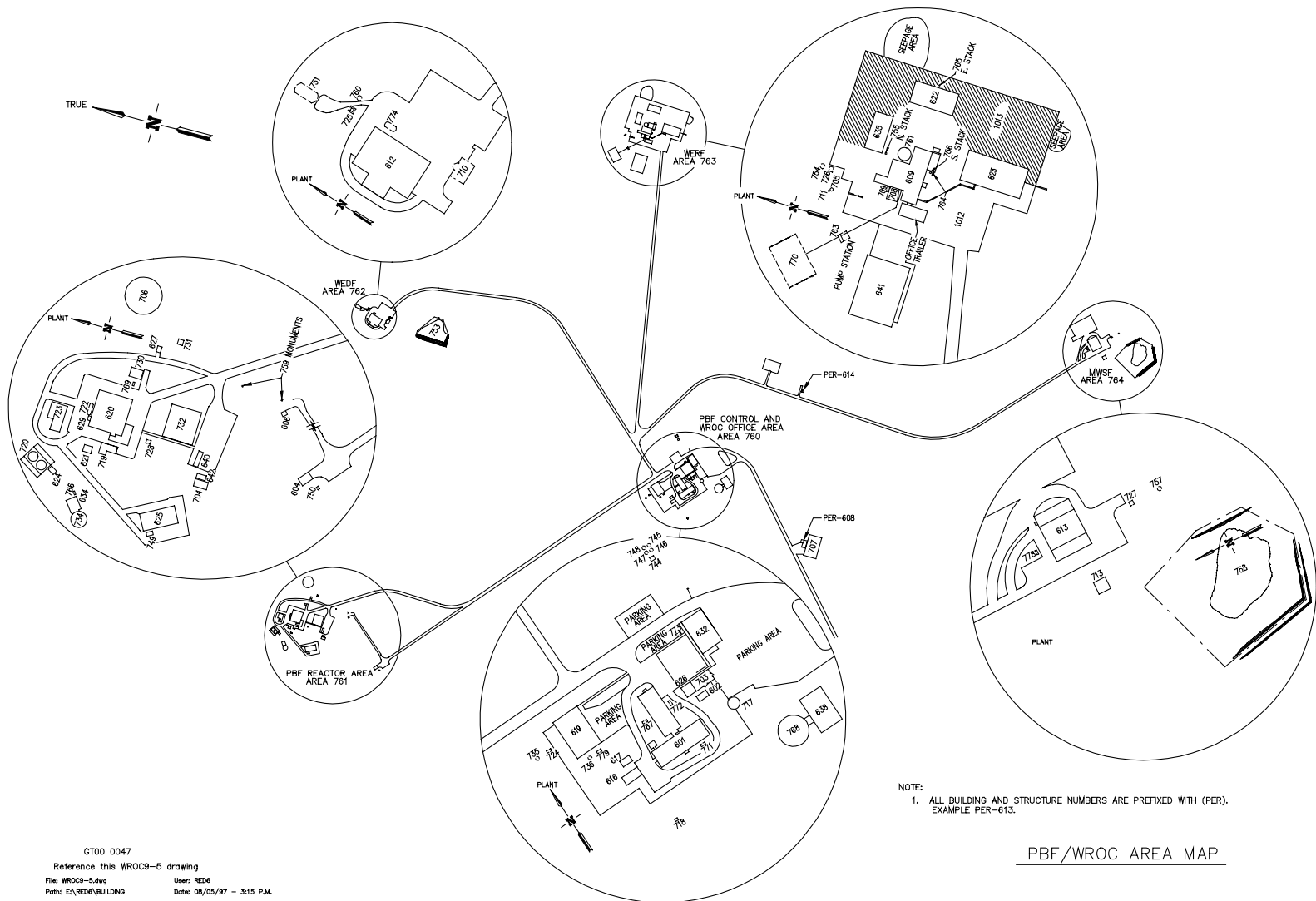


Figure V-1-1. Location of the WROC areas at the INEEL.

Figure V-1-2. Layout and physical location of the individual WROC areas.



1.2 WROC Air Emissions Source Listing

The only significant air emission point at the WROC Area is the heating boiler at the PBF reactor building. No emissions are associated with waste operations at the Waste Engineering Development Facility or the WERF waste storage building.

Tables V-1-1, V-1-2, and Table V-1-3 are comprehensive listings of all significant and not-significant air emission (radionuclide and non-radionuclide) sources for WROC. The first table is the significant air emission sources that are detailed in this application. The second table is the not-significant sources that meet the not-significant criteria described in Volume I. These not-significant sources will not be specifically addressed in this permit application other than in this listing. The third table lists not-significant radionuclide air emission sources.

Table V-1-1. Significant air emission sources at the WROC Area.

Building No.	Building Name	Vent/Stack Number	Source Description	Comments
PER-620 ^a	Reactor Building	PER-620-023	Boiler	Criteria Pollutants
Multiple ^b	Multiple	Multiple	Internal combustion engines	These units are not specifically exempted by IDAPA 58.01.01.317

a. This source has consumed prevention of significant deterioration increment. General discussion of this program is included in Volume I.

b. This category includes multiple units at varying locations. They are addressed generally as a source category.

Table V-1-2. Not-significant non-radionuclide air emission sources at WROC.

Building No.	Building Name	ID# for Vent/Stack or Tank	Source Description	Justification
PER-601	PBF Control Area	PER-601-010	Furnace Stack	IDAPA 58.01.01.317.b.i.(30)
	PBF Control Area	PER-601A-010	Furnace Stack	IDAPA 58.01.01.317.b.i.(30)
	Power Excursion Reactor	PER771001	2500-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
	Power Excursion Reactor	PER772001	1000-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-612	Waste Engineering Development Facility	PER-612-006	Furnace Stack	IDAPA 58.01.01.317.b.i.(30)
	Waste Engineering Development Facility	PER774001	2500-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-632	WROC Support	PER-632-007	Furnace Stack	IDAPA 58.01.01.317.b.i.(30)
PER-632	WROC Support	PER-632-008	Furnace Stack	IDAPA 58.01.01.317.b.i.(30)
	PBF Control Area	PER773001	2500-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-625	PBF Maintenance and Storage	PER625002	24-gal fuel tank (inactive)	IDAPA 58.01.01.317.b.i.(30)

Table V-1-2. (continued).

Building No.	Building Name	ID# for Vent/Stack or Tank	Source Description	Justification
PER-620	PBF Reactor Building	PER722001	10000-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-619	PBF Control Building	PER779001	2500-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-626	PBF Control Area	PER626005	110-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-705	WERF	PER705001	4000-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-711	WERF	PER711001	350-gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-755	Waste Experimental Reduction Facility	PER-755-001	WERF north stack	IDAPA 58.01.01.317.b.i.(30)
PER-621	PBF RX Outbuilding	PER-621-001	Propane generator inside	IDAPA 58.01.01.317.b.i.(5)
PER-638	PBF Control Area	PER638005	350 gal fuel tank	IDAPA 58.01.01.317.b.i.(30)
PER-619	PBF Control Area	PER-619-015	Furnace stack	IDAPA 58.01.01.317.b.i.(30)
PER-619	PBF Control Area	PER-619-016	Furnace stack	IDAPA 58.01.01.317.b.i.(30)
	Demolition Debris Reduction ^a		Site-wide	IDAPA 58.01.01.317.b.i.(30)

a. Assigned to D&D, not a WROC asset.

1.3 Not-Significant Radionuclide Emission Source Descriptions

1.3.1 PER-613, Mixed Waste Storage Facility

The MWSF occupies the former SPERT IV reactor building. It is a Resource Conservation and Recovery Act (RCRA)-approved storage facility for RCRA hazardous and mixed waste. The emission point of interest is PER-613-021, the repackaging booth, which received a directors exemption from the State of Idaho, DEQ (06/24/96, DEQ, Subject: A-960064 DOE/INEL MWSF).

PER-613-021 is the repackaging booth located at the MWSF. The intent of the facility is to conduct repackaging of mixed waste as well as sampling and verification. The repackaging booth is a pretreatment step used for other operational processes. Emissions from the repackaging booth are vented through the PER-613-021 stack. Emission control equipment consists of a HEPA filtration system and an organic filter.

1.3.2 PER-620-016, Reactor Main Stack/Roof Vent

PER-620-016 is the reactor main stack/roof vent, which processes off-gas from the PBF Reactor building. The PBF Reactor is being maintained until a new mission is identified or until inactivated. Maintaining the reactor includes preserving the negative air pressure for personnel safety requirements; therefore, the radionuclide emissions associated with the building off-gas represent standby conditions. Emissions from the facility are representative of residual contamination of the facility components and normal background levels of radionuclides. Current operations are limited to maintaining the reactor and support equipment to meet safety requirements, handling/removal of spent nuclear fuel, and clean-up activities. Any additional operations such as operating the facility will be permitted accordingly.

Several operations and related structures support the facility operations. The reactor cooling towers, PER-720, are currently in use for equipment cooling. The reactor canal provides storage for irradiated reactor fuel. The emissions from the canal vent out the reactor main stack but can vent out the roof vent when open during summer months. This vent is normally only used in hot weather and would be immediately secured if an airborne activity area were present in the exhausted area. The emissions from this source are conservatively calculated assuming that the activity level is at the threshold of an air activity area. The main stack is continuously monitored for radioactive particulate emissions. PER-706-001, PBF reactor evaporation tank, collects discharges from the regeneration waste water and eyewash flushes, and if necessary, could be used to evaporate the secondary coolant water from the PBF reactor. The evaporation tank is a prefabricated structure erected to replace the original PBF evaporation pond. The evaporation pond was remediated for chromium used to treat equipment cooling water. Chromium has been replaced by nonhazardous phosphate and slimacide products.

PER-730, the PBF reactor primary coolant water storage tank, and PER-731, the PBF corrosive waste sump, also support reactor operations. During reactor operations, the coolant water storage tank stored reactor primary coolant water prior to discharge or recycling. This provided the capability for re-using the primary coolant water to reduce generation of contaminated waste water. No water is currently being stored in the tank. The discharge sump is the final storage area before discharge to the evaporation tank. There are no emissions associated with the normal operation of the storage tank and sump.

Additional operations associated with the reactor include a decontamination fume hood located in PER-620. The fume hood supports periodic decontamination of contaminated equipment. Periodically the demineralizer requires regeneration of the demineralizer columns and system. Sulfuric acid and sodium hydroxide are used in the demineralization and regeneration processes. The neutralized effluent from regenerating the demineralizer is discharged to the evaporation tank by way of the corrosive waste

sump. The decontamination fume hood and the demineralizers have not been used since 1993 as a result of the reactor standby condition.

Reactor off-gas and reactor building ventilation exit through the main stack via the HEPA filter bank. The PBF reactor main stack uses a HEPA filter bank to control radionuclide particulate emissions. The PBF stack is monitored for particulate radionuclides. Analysis of sample filters includes gamma spectrometric analysis and appropriate isotopic analysis if the gross alpha or gross beta counts indicate a need for analysis. There is one sampling site with one sampling point. The analytical stack-gas monitor is comprised of sample nozzle and interconnecting tubing, and particulate monitor sample filters.

1.3.3 PER-620-041, Decontamination Sink Vent

PER-620-041, decontamination sink vent, discharges ventilation air from the hood over the decontamination sink in the PBF Reactor Building. The vent is HEPA filtered. The decontamination sink is used periodically to wash down (with soap and water) tools and other small items contaminated with low levels of radionuclides. No emissions control or emissions monitoring equipment is required for operation of the PER-620 sink.

1.3.4 PER-706-001, Evaporation Tank

PER-706-001, PBF Evaporation Tank, receives discharges from the regeneration waste water and eye wash flushes. The tank was constructed in 1994 as a like-for-like replacement of the evaporation pond. The tank may be used in the future to evaporate slightly radioactive water from other sources. No emission control equipment is associated with the Evaporation Tank. Emission monitoring equipment is not required per 40 CFR 61.93.

1.3.5 PER-755, WERF North Stack

PER-755 is the Waste Experimental Reduction Facility (WERF) north stack, which exhausts the processes associated with the WERF Buildings, PER-609 and PER-635. The WERF Building houses the waste incineration and waste stabilization operations and associated office space. Figure V-1-2 shows a plan view of the WERF facilities. The WERF facilities were developed for research in radioactive waste handling, decontamination, and volume reduction techniques. Several methods initially used include sizing, decontamination, compaction, and stabilization activities. At this time, the melting and decontamination activities have been discontinued.

WERF provides a means to reduce the volume of low-level radioactive waste and store and treat hazardous waste and mixed low-level waste, from both on and off-site. Low-level waste is defined as any radioactively contaminated waste not related to spent nuclear fuel, alpha-emitting transuranic radionuclides with half-lives less than 20 years or concentrations less than 100 nCi/g, not related to mill tailings. Hazardous waste is defined as part of the Resource Conservation and Recovery Act according to 40 CFR 261. Mixed low-level waste is a combination of low-level radioactive and hazardous waste. Most waste originates at the INEEL from a variety of research activities, ongoing projects, decontamination activities, and routine monitoring and maintenance of INEEL facilities.

The North Stack emission controls include a baghouse, roughing filters, and HEPA filters to support emissions from PER-609.

1.3.6 PER-756, WERF South Stack

The WERF south stack is the effluent release point for the WERF heat exchanger and a portion of the general PER-609 building ventilation. The south stack is also used during maintenance and filter change-out of the WERF north stack baghouse and HEPA filters.

The WERF south stack exhausts ventilation air from three areas in the incinerator building. For most of the year, no radionuclides are released into the ventilation system from these areas during normal operations. One or two times each year, a small quantity of radionuclides may be released to one of the ducts during replacement of the WERF north stack HEPA and baghouse filters. The other two duct systems have HEPA filters as a protective measure.

General ventilation air within the incinerator room passes through a HEPA filter bank. During normal operations, there are no releases of radionuclides from this room. The filter bank consists of 12 HEPA filters in a 3×4 array. The basement temporary accumulation area ventilation air passes through a HEPA filter bank. This filter bank consists of six HEPA filters in a 2×3 array. Ventilation air may be redirected through this HEPA filter bank or through a portable HEPA filter bank during replacement of the north stack HEPA and baghouse filters. This redirected air is the only potential source of radionuclide emissions from the WERF south stack. Finally, clean air from the shell side of the heat exchanger is released from the south stack. The TAA/North Stack maintenance connection HEPA filter bank is tested in the same manner as the north stack HEPA filter bank.

A preventive maintenance program ensures that all HEPA filters are routinely tested for efficiency to avoid failure. A breached, plugged, or leaking filter is considered a failure. Filter elements are taken out of service if the removal efficiency is below the minimum 99.97%. Filters are tested according to American National Standards Institute N510-1989. The operational surveillance program includes a requirement to regularly check and record readings on the differential pressure indicators across the TAA/North Stack maintenance connection HEPA filter bank. If the pressure drop exceeds 10 inches water column, the filters are removed and replaced with new HEPA filters. The new filters are tested

according to the American National Standards Institute requirements. The WERF south stack is monitored periodically. These results are used to verify that the calculated emissions are conservatively high.

1.3.7 PER-765, WERF East Stack

The WERF east stack vents the process off-gas from compaction, macroencapsulation and sizing operations including processes emissions (622-003). Material to be sized is transferred to the sorting area and prepared for sizing. Sizing results in a volume reduction of up to 5:1 and allows larger items to be placed into containers for disposal.

Sizing equipment includes a plasma-arc torch cutting system. Other cutting equipment is used as necessary and includes mechanical sizing with saws, various hand tools, and power tools. After sizing, the material is packed in an appropriate waste container and staged for shipment to a disposal facility, or stored for future treatment.

Nonincinerable solid waste is compacted using a 400,000-lb hydraulic press resulting in volume reductions of approximately 5:1. Waste is compacted in a metal container which is positioned in the compactor. Full containers are removed from the compactor by forklift. The lid is locked in place, and the containers are staged for shipment to a disposal facility. The sizing and compaction operation off-gas passes through a filtration system involving HEPA and fabric filters that control radionuclide particulate emissions. The sizing building ventilation system is independent of the incinerator ventilation system. Air is drawn from the compactor and the sizing room via separate ducts. These ducts merge just before the air stream enters two dust-collectors that are connected in series. These dust collectors are similar in operation and approximate efficiency to the baghouse filter in the incinerator building.

Air exiting the dust collector system passes through a HEPA filter bank. Enclosed within this bank is a roughing filter and a set of HEPA filters. The roughing filter is used to further extend the life of the HEPA filters. The filter bank consists of five HEPA filters in a 1 × 5 array. The pressure drop across the WERF east stack HEPA filters will be maintained below 5 inches water column.

A preventive maintenance program ensures that all HEPA filters are routinely tested for efficiency to avoid failure. The compactor has an untested HEPA filter at the chamber outlet. Air is drawn through the chamber by the sizing facility fan system, passes through the HEPA filter, and then passes through the dust collector/HEPA filter system described above. The WERF east stack HEPA and roughing filters are tested as a single unit in the same manner as the north stack HEPA filter bank.

Table V-1-3 lists the not-significant radionuclides air emission units for WROC. Not-significant sources meet the criteria described in Volume 1, Section 3.

Table V-1-3. Not-significant radionuclide air emission sources.

Source ID		Source description
PER-613-021	A,C	Repackaging booth ^a
PER-620-016	A,B,C	Reactor main stack/roof vent
PER-620-041	A,C	Decontamination sink vent
PER-706-001	A,C	Reactor evaporation tank
PER-755-001	D,C	WERF north stack
PER-756-001	A,B,C	WERF south stack
PER-765-001	D,C	WERF east stack ^b

a. Director's Exemption.

b. Listed as not significant for PM.

All the above sources do the following:

- A. Annual emission determinations (means calculated emissions),
- B. Periodic confirmatory monitoring to determine the need for continuous emission monitoring (point sources only),
- C. Keeping records of emission determinations and periodic confirmatory monitoring,
- D. Continuous monitor.

The annual radiological emissions from these sources are combined with all other radionuclide emissions from the INEEL to determine compliance with the 10 mrem/yr EDE as required in 40 CFR Part 61, Subpart H. The results are published in the Annual Radionuclide Emissions Report for the INEEL.

2. SOURCE SPECIFIC INFORMATION



2.1 PER-620 PBF Reactor Area

2.1.1 General Description

PER-620 houses the PBF reactor. In 1970, the PBF reactor was built north of the SPERT I reactor site to support DOE/Nuclear Regulatory Commission's fuel behavior studies during normal/off-normal operating conditions. PER-620-023, the commercial heating boiler, is the one significant emission source for WROC. Figure V-2-1 shows the plan view for PER-620.

2.1.2 PER-620-023 Specific Information

The following sections contain source-specific information for emission point PER-620-023 commercial boiler. See Figure V-2-2 for the state operating permit application form for this source.

2.1.2.1 Process Description. PER-620-023, commercial boiler, is used for space heating requirements of the PBF Reactor Building. The boiler is fueled with diesel No. 2, and ignited by propane. The diesel fuel is supplied by tank PER-722-001. Figure V-2-3 shows the process flow diagram. No emissions control equipment is required for operation of the PER-620 boiler. No emissions monitoring equipment is required for operation of the PER-620 boiler.

2.1.2.2 Maximum Regulated Pollutant Emissions. The following data addresses limits for which this source must maintain compliance. Limits are based on the NO_x limit for this source established in the ICPP NO_x Sources PTC-023-00001, February 13, 1995 (see the following section for emission).

Pollutant	CAS	Annual Maximum Emission	Units	Criteria Pollutant
CO	630-08-0	2.0E-01 ^a	ton/yr	X
NO _x	—	7.9E-01	ton/yr	X
VOC (non-methane)	—	1.3E-02 ^a	ton/yr	X
SO _x	7446-09-05	2.8E+00 ^a	ton/yr	X
PM	—	7.9E-02 ^a	ton/yr	X

a. These limits are based on permit limit for NO_x emissions.

2.1.2.3 Compliance Requirements.

2.1.2.3.1 Permitted Emission Limits—NO_x emissions from this source are limited to 0.24 lb/hr and 0.79 ton/yr by the ICPP NO_x Sources PTC 023-00001.

2.1.2.3.2 Existing Permit Requirements—Emission limits in the above table apply to this source. This source is regulated by conditions in the ICPP NO_x Sources PTC 023-00001, reissued 10/99.

2.1.2.3.3 Other Enforceable Requirements—The State of Idaho regulates visible emissions as determined by emission opacity. Visible emissions shall not exceed 20% opacity for a period or periods aggregating more than 3 minutes in any 60-minute period. See compliance methodology form in Volume I.

2.1.2.4 Compliance Methodology and Status.

2.1.2.4.1 Compliance Plan—The source is in compliance with applicable requirements; a compliance plan is not required. For each applicable requirement that will become effective during the term of the Tier I operating permit that does not contain a more detailed schedule, this source will meet the applicable requirement on a timely basis. For each applicable requirement that will become effective during the term of the Tier I operating permits that contains a more detailed schedule, this source will comply with the applicable requirement on the schedule provided in the applicable requirement.

2.1.2.4.2 Compliance Methodology Forms—See Figure V-2-4.

2.1.2.5 Emission Calculations. The following section provides a description of calculations used to calculate emissions in the regulated pollutant table.

2.1.2.5.1 Nonradionuclide Emissions—Emissions from this boiler are limited by the ICPP NO_x Sources PTC. Allowable gallons per year consumed by the boiler are back-calculated from the NO_x limit and AP-42 emission factors presented on the state form (also see Appendix C of Volume I), as follows:

Note: The boiler is equipped with two feed nozzles, each allowing only 3.5 gallons per hour of fuel. This physical restriction restricts the NO_x emissions to less than the hourly and yearly NO_x limit.

Assumptions:

Fuel: No. 2 or No. 1/No. 2 blend

Max gph:12

2 feed nozzles only allow for 7 gallons per hour (3.5 gallons per nozzle)

NO_x limit = 0.79 ton/yr (ICPP NO_x Sources PTC)

Fuel Consumption:

Max gal/yr = 0.79 ton NO_x/yr x 2000 lb/ton x 1000 gal/20lb NO_x = 7.9E+04 gal/yr

7 gallons per hour x 8,760 hours per year = 61,320 gallons per year which is below the maximum allowable gallons per year of 79,000 gallons per year

(Remainder of criteria pollutant emissions are calculated from fuel consumption and AP-42 emission factors)

Operating Schedule:

Weeks/yr = 7.9E+04 gal/year x 1 hr/12 gal x 1 day/24 hr x 1 week/7 days = 39 weeks/yr (6552 hr/yr)

Figure V-2-1. Plan view for PER-620

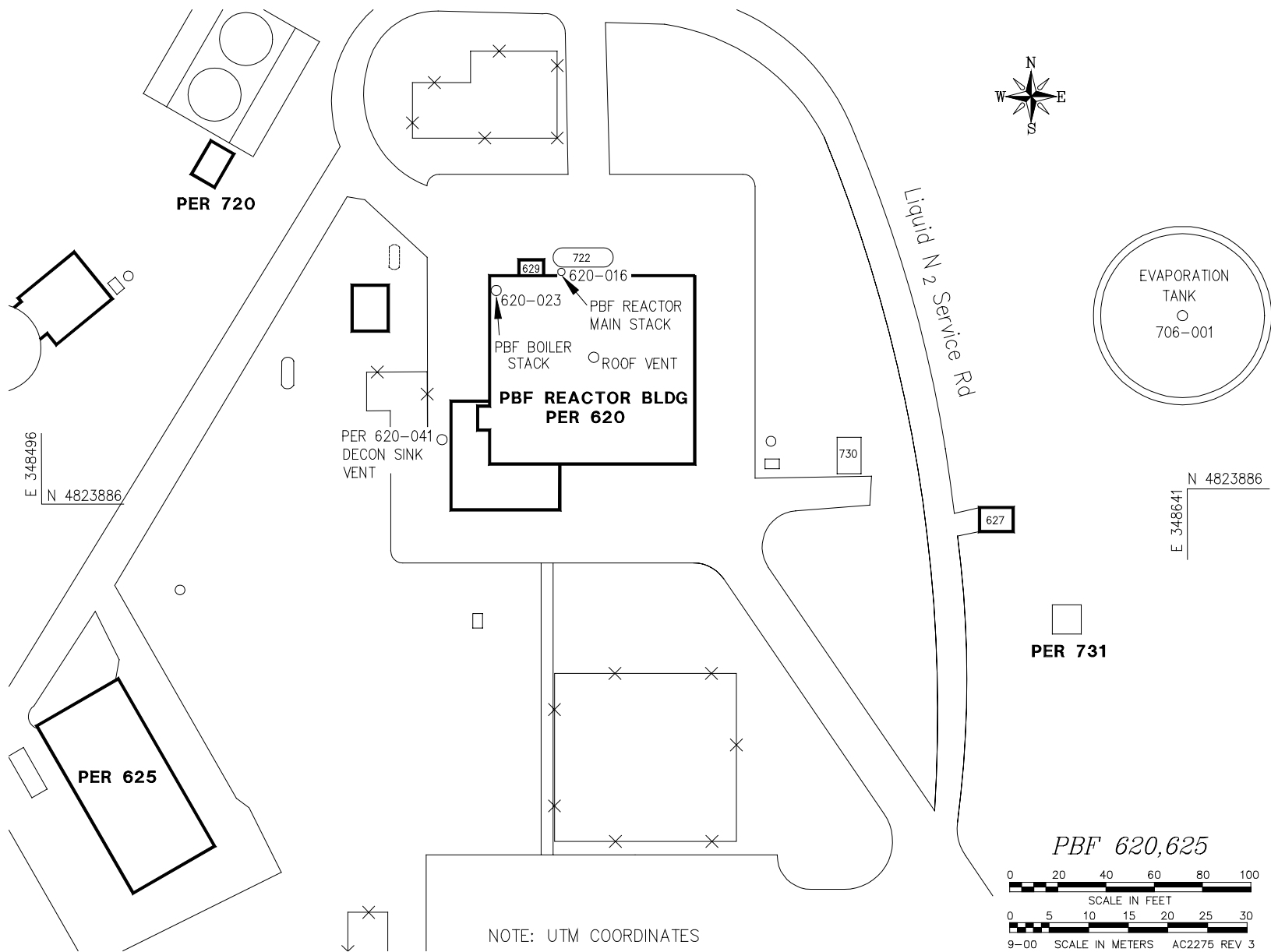


Figure V-2-2. State Operating Permit Application Form.

DEQ USE ONLY		DEQ USE ONLY	
DEQ PLANT ID CODE		DEQ PROCESS CODE	
DEQ STACK ID CODE		DEQ BUILDING ID CODE	
PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE			

PART A

GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION	STACK DESCRIPTION	BUILDING DESCRIPTION
PBF - 620 - 023	Boiler Stack	PBF - 620
MANUFACTURER	MODEL	DATE INSTALLED OR LAST MODIFIED
Cyclotherm	16715-C5-1725L-2-43	1969

RATED CAPACITY (CHOOSE APPROPRIATE UNITS)

MILLION BTU/HOUR		OR	THOUSAND LBS/HR STEAM		OR	KILOWATTS		OR	HORSEPOWER
1.6									NA
BURNER TYPE			PERCENT USED FOR PROCESS			PERCENT USED FOR SPACE HEAT			
11						100			

(1) BURNER TYPES: 01) SPREADER STOKER, 02) CHAIN OR TRAVELING GRATE, 03) HAND FIRED, 04) CYLONE FURNACE, 05) WET BOTTOM (PULVERIZED COAL), 06) DRY BOTTOM (PULVERIZED COAL), 07) UNDERFEED STOKER, 08) TANGENTIALLY FIRED, 09) HORIZONTALLY FIRED, 10) AXIALLY FIRED, 11) OTHER (SPECIFY TO THE RIGHT):

Pressure-Atomizing Burner

FUEL DATA

PARAMETER	PRIMARY FUEL	UNITS	SECONDARY FUEL	UNITS
FUEL CODE (2)	02		NA	
PERCENT SULFUR	0.5		NA	
PERCENT ASH	NA		NA	
PERCENT NITROGEN	NA		NA	
PERCENT CARBON	NA		NA	
PERCENT HYDROGEN	NA		NA	
PERCENT MOISTURE	NA		NA	
HEAT CONTENT (BTU/UNIT)	140,000	gallons	NA	NA
MAXIMUM HOURLY COMBUSTION RATE (UNITS/HR)	12	gallons	NA	NA
NORMAL ANNUAL COMBUSTION RATE (UNITS/YR)	79,000	gallons	NA	NA

(2) FUEL CODES 01) NATURAL GAS, 02) #1 OR #2 FUEL OIL, 03) #4 FUEL OIL, 04) #5 FUEL OIL, 05) USED OIL, 06) WOOD CHIPS, 07) WOOD BARK, 08) WOOD SHAVINGS, 09) SANDER DUST, 10) SUBBITUMINOUS COAL, 11) BITUMINOUS COAL, 12) ANTHRACITE COAL, 13) LIGNITE COAL, 14) PROPANE, 15) OTHER (SPECIFY TO THE RIGHT):

V-17

Figure V-2-2. (continued).

PART B

OPERATING DATA

PERCENT OPERATIONS PER QUARTER				NORMAL OPERATING SCHEDULE				
DEC-FEB	MAR-MAY	JUN-AUG	SEP-NOV	HOURS/DAY	DAYS/WEEK	WEEKS/YEAR		
41	27	5	27	24	7	39		

POLLUTION CONTROL EQUIPMENT

VENTILATION AND BUILDING/AREA DATA

ENCLOSED? (Y/N)	HOOD TYPE (APP I)	MINIMUM FLOW (ACFM)	% CAPTURE EFFICIENCY
NA	NA	NA	NA
BUILDING HEIGHT (FEET)	BUILDING/AREA LENGTH (FEET)	BUILDING/AREA WIDTH (FEET)	
NA	NA	NA	

STACK DATA

GROUND ELEVATION (FT)	UTM X COORDINATE (KM)	UTM Y COORDINATE (KM)	STACK ^a TYPE
4922	385.54 km	4223.91	02
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	STACK EXIT DIAMETER (IN)	STACK EXIT GAS FLOW RATE (ACFM)	STACK EXIT TEMP (°F)
22	12	575	250

a. 01) DOWNWARD, 02) VERTICAL (UNCOVERED), 03) VERTICAL COVERED, 04) HORIZONTAL, 05) FUGITIVE

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS	ALLOWABLE EMISSIONS	REFERENCE
Carbon Monoxide	630-08-0	5 lb/10 ³ gal	NA	6.0E-02 2.0E-01 ton/yr	NA	AP-42
Nitrogen Oxides	NA	20 lb/10 ³ gal	NA	2.4E-01 7.9E-01 ton/yr	0.24 lb/hr 0.79 ton/yr	AP-42, INTEC NO _x PTC (2/95)
Particulates	NA	2 lb/10 ³ gal	NA	2.4E-02 7.9E-02 ton/yr	NA	AP-42
Sulfur Oxides	7446-09-5	72 lb/10 ³ gal	NA	8.6E-01 2.8E+00 ton/yr	NA	AP-42
VOC-Nonmethane	NA	0.34 lb/10 ³ gal	NA	4.1E-03 1.3E-02 ton/yr	NA	AP-42
IN LBS/UNITS. Use same hourly UNITS given PROCESSING DATA						

a. Emission factor 72 results from 144 multiplied by the % weight sulfur content. Source AP-42, Table 1.3-1 data for "commercial equipment."
 Note: The normal INEEL heating season is 39 weeks. The maximum schedule shown allows for flexibility for unusual weather and off-season maintenance.



Figure V-2-3. Process flow diagram for PER-620-023.

Emission Point Number PER-620-023

REQUIREMENT

Applicable requirement: Permit limit NO_x of 0.24 lb/hr and 0.79 ton/yr,

Requirement basis: INTEC NO_x PTC 023-00001, reissued 2/95

Monitoring requirements: None

Method required for determining compliance: Recordkeeping

REFERENCE TEST METHOD

Reference test method description: NA

Reference test method citation: NA

MONITORING

Monitoring device type: NA

Monitor location description: NA

Regulated pollutant being monitored: NO_x

RECORDKEEPING

Data (parameter) being recorded: Total annual fuel use (gal) and monthly hours of operation

Frequency of recordkeeping (how often data recorded): Annually

REPORTING

Generally describe what is reported: Estimated Emissions

Frequency of reporting: Annual Air Emissions Inventory

Beginning date: NA

Figure V-2-4. Compliance Certification Form (method of compliance).

2.2 Internal Combustion Engines

2.2.1 General Description

Internal combustion engines of various sizes and configurations are utilized at WROC. These engines are either PTC grandfathered units or units which qualified for a PTC exemption in accordance with IDAPA 58.01.01.220. Engines may be gasoline, propane or diesel-fired. Uses for these units include: emergency generators, stand-by generators, and fire-water pumps.

2.2.2 Engine Specific Information

Internal combustion engines currently in use at WROC.

Building Number	Building Name	Vent/Stack Number	Source Description
PER-609	WERF	PER-609-006	335-hp Diesel-Fired Emergency Generator
PER-638	Water Pumphouse	PER-638-004	200-hp Diesel-Fired Firewater Pump
PER-621	PBF Reactor Outbuilding	PER-621-001	<100-hp Propane-Fired Generator
N/A	Rock Crusher	N/A	420-hp Diesel Engine ^a

a. This is a mobile D&D source, not a permanent WROC source.

2.2.2.1 Process Description—These units are utilized for various support functions at WROC.

2.2.2.2 Maximum Regulated Pollutant Emissions—Emissions are not quantified here because type and number of units may be continually changing and there are no associated emission limits.

2.2.2.3 Compliance Requirements

2.2.2.3.1 Permitted Emission Limits—None.

2.2.2.3.2 Existing Permit Requirements—None.

2.2.2.3.3 Other Enforceable Requirements

- Emissions from these units shall not cause opacity which is greater than 20% for more than three minutes in any 60-minute period.
- Diesel engines shall not burn fuel with a sulfur content greater than 0.5% by weight.

(Refer to Volume I for compliance certification forms.)

2.2.2.4 Compliance Methodology and Status

2.2.2.4.1 Compliance Plan—These sources are in compliance and will continue to comply with the indicated applicable requirements as described in this application. For each applicable requirement that will become effective during the term of the Tier I operating permit that does not contain a more detailed schedule, these sources will meet the applicable requirement on a timely basis. For each applicable requirement that will become effective during the term of the Tier I operating permit that contains a more detailed schedule, these sources will comply with the applicable requirement on the schedule provided in the applicable requirement.

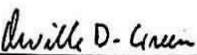
2.2.2.4.2 Compliance Methodology Forms—Not required for these units.

2.2.2.5 Emission Calculations—N/A.

Appendix A

Permits

STATE OF IDAHO PERMIT TO CONSTRUCT AN AIR POLLUTION EMITTING SOURCE		PERMIT NUMBER <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 2 3 - 0 0 0 0 1</div>			
		AQCR <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 6 1</div>	CLASS <div style="border: 1px solid black; padding: 2px; display: inline-block;">A 1</div>	SIC <div style="border: 1px solid black; padding: 2px; display: inline-block;">9 9 9 9</div>	
		ZONE <div style="border: 1px solid black; padding: 2px; display: inline-block;">1 2</div>	UTM COORDINATE (km) <div style="border: 1px solid black; padding: 2px; display: inline-block;">3 4 3 . 9</div>		<div style="border: 1px solid black; padding: 2px; display: inline-block;">4 8 2 6 . 0</div>

1. PERMITTEE				
U.S. Department of Energy, Idaho Operations Office				
2. PROJECT				
Idaho Nuclear Technology and Engineering Center, Nitrogen Oxide Sources				
3. MAILING ADDRESS		CITY	STATE	ZIP CODE
785 DOE Place		Idaho Falls	Idaho	83401-1562
4. SITE LOCATION COUNTY	NO. OF FULL-TIME EMPLOYEES	PROPERTY AREA AT SITE (Acreage)		
Butte	8,100	569,600		
5. PERSON TO CONTACT		TITLE	TELEPHONE	
Lisa A. Green		DOE Environmental Programs	(208) 526-0417	
6. EXACT PLANT LOCATION				
Eight (8) miles north of the southern border of INEEL on Lincoln Blvd., INEEL				
7. GENERAL NATURE OF BUSINESS & KINDS OF PRODUCTS				
Energy Research and Development				
8. GENERAL CONDITIONS				
<p>This permit is issued according to the <i>Rules for the Control of Air Pollution in Idaho</i>, Section 16.01.01.200, and pertains only to emissions of air contaminants that are regulated by the State of Idaho and to the sources specifically allowed to be constructed by this permit.</p> <p>This permit (a) does not affect the title of the premises upon which the equipment is to be located, (b) does not release the Permittee from any liability for any loss due to damage to person or property caused by, resulting from, or arising out of the design, installation, maintenance, or operation of the proposed equipment, (c) does not release the Permittee from compliance with other applicable federal, state, tribal, or local laws, regulations, or ordinances, (d) in no manner implies or suggests that the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) or its officers, agents, or employees, assumes any liability, directly or indirectly, for any loss due to damage to person or property caused by, resulting from, or arising out of design, installation, maintenance, or operation of the proposed equipment.</p> <p>This permit is not transferable to another person, place, piece or set of equipment. This permit will expire if construction has not begun within two years of its issue date or if construction is suspended for one year.</p> <p>This permit has been granted on the basis of design information presented with its application. Changes of design or equipment that result in any change in the nature or amount of emissions must be approved in advance by DEQ unless exempted by the <i>Rules for the Control of Air Pollution in Idaho</i> Sections 220 through 223.</p>				
 ADMINISTRATOR, STATE AIR QUALITY PROGRAM DIVISION OF ENVIRONMENTAL QUALITY		DATE: October 18, 1999		

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PERMIT TO CONSTRUCT
PERMITTEE, PROJECT, AND LOCATION

U.S. Department of Energy
 INEEL/INTEC
 Idaho Falls, Idaho

PERMIT NUMBER

0 2 3 - 0 0 0 0 1

SOURCE

A. Fluorinal and Storage Facility (FAST)

1. SOURCE DESCRIPTION

1.1 FAST Process Description

Receipt, movement, and general handling of nuclear fuel is associated with the storage of fuel in the FAST (Fluorinal and storage) facility. Storage of fuel is maintained in large water-filled basins. Areas in the building and equipment associated with the past practice of dissolving fuel are shutdown.

1.2 FAST Control Description

The FAST final exhaust is vented through four (4) parallel sets of filters consisting of prefilters and a stage of High Efficiency Particulate Air (HEPA) filters. Each stage is made up of twenty-four (24) individual HEPA filters. Normally all four (4) separate air streams are on-line going through the filters. Any one of the separate filter banks may be isolated to allow maintenance or other activities. All gases emitted from the FAST pass through these final stages of HEPA filtration before entering the FAST stack.

1.3 FAST Equipment Listing

- 1.3.1 FAST stack
- 1.3.2 FAST fuel storage basin
- 1.3.3 FAST dissolution cell
- 1.3.4 HEPA filters (two in series) at the FAST dissolution cell
- 1.3.5 FAST FM area vessels
- 1.3.6 Prefilter stages (four in parallel)
- 1.3.7 HEPA filtration stages (four in parallel)

1.4 FAST Stack Specifications

The FAST stack (CPP-676-001) has the following specifications:

Stack Height	-	160.0 feet
Stack Diameter	-	5.4 feet
Flow Rate	-	92,000 acfm (actual cubic feet per minute)

2. EMISSION LIMITS

Emissions of radionuclides from the FAST stack shall not, by themselves, or in combination with emissions from other INEEL sources, exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent in excess of ten (10) millirem per year, in accordance with 40 CFR 61, Subpart H. Doses due to radon-220 and radon-222, and their respective decay products are excluded from this limit.

DATE: October 18, 1999

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**PERMIT TO CONSTRUCT
PERMITTEE, PROJECT, AND LOCATION**

U.S. Department of Energy
INEEL/INTEC
Idaho Falls, Idaho

PERMIT NUMBER

0 2 3 - 0 0 0 0 1

SOURCE

A. Fluorinal and Storage Facility (FAST)

3. OPERATING REQUIREMENTS

3.1 Radionuclide Requirements

The permittee shall maintain and operate instrumentation in accordance with 40 CFR 61, Subpart H, to verify proper operation of the air pollution control equipment installed and ensure that the limits in Section 2 are met.

3.2 HEPA Filter Requirements

The permittee shall install, operate, and maintain at least one (1) stage of HEPA filters having a minimum particle removal efficiency of no less than 99.97%. The permittee shall maintain and operate instrumentation to measure the pressure drop across the filter stages. HEPA filter efficiency shall be tested after installation and on an annual basis according to the ANSI N510 testing standard. All HEPA filters must be pretested and certified prior to installation and must meet government performance specifications and overpressure and rough handling requirements per MIL-F-51068. The permittee shall maintain written procedures in place which specify the conditions which require change out of the filters.

4. MONITORING REQUIREMENTS

4.1 Radionuclide Monitoring

The permittee shall perform radionuclide sampling and dose calculations as specified by 40 CFR 61, Subpart H. Effective dose equivalents to members of the public shall be calculated using EPA-approved sampling procedures and EPA model CAP-88PC or other EPA-approved models.

4.2 EPA Filter Monitoring

The permittee shall monitor the pressure drop across the HEPA filter stages.

5. REPORTING REQUIREMENTS

The permittee shall submit an annual report by July 1 that provides the results of dose calculations based on collected INEEL emissions during the preceding calendar year (January 1 to December 31).

DATE: October 18, 1999

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PERMIT TO CONSTRUCT PERMITTEE, PROJECT, AND LOCATION	PERMIT NUMBER									
U.S. Department of Energy INEEL/INTEC Idaho Falls, Idaho	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px; text-align: center;">0</td> <td style="width: 20px; height: 20px; text-align: center;">2</td> <td style="width: 20px; height: 20px; text-align: center;">3</td> <td style="width: 20px; height: 20px; text-align: center;">-</td> <td style="width: 20px; height: 20px; text-align: center;">0</td> <td style="width: 20px; height: 20px; text-align: center;">0</td> <td style="width: 20px; height: 20px; text-align: center;">0</td> <td style="width: 20px; height: 20px; text-align: center;">0</td> <td style="width: 20px; height: 20px; text-align: center;">1</td> </tr> </table>	0	2	3	-	0	0	0	0	1
0	2	3	-	0	0	0	0	1		
SOURCE										
B. LET&D, Ventilation Air System, and Process Off-Gas System										

1. SOURCE DESCRIPTION

The emissions exhausting from the main stack are derived from three (3) separate systems: the Liquid Effluent Treatment and Disposal (LET&D) facility, the ventilation air system, and the process off-gas system.

1.1 LET&D Process and Control Description

The LET&D facility treats the Process Equipment Waste (PEW) Evaporator condensate, which is a low-level liquid waste (LLLW), by an acid fractionation process. The acid portion or bottoms are used at the New Waste Calcining Facility (NWCF) or stored in the Tank Farm. The remaining gaseous overheads are discharged to the main stack.

The gaseous overheads, produced in the fractionation process, are processed through one of two parallel off-gas trains. The LET&D off-gas trains consist of a mist eliminator, a superheater, two banks of HEPA filters, and a blower. Liquid droplets are removed by mist eliminators and returned to the fractionators. The gas is then heated to ensure there is no liquid water in the stream. Any solids are removed by HEPA filters. There are two (2) HEPA filter banks, one (1) of which is required to be operating whenever a fractionator is operated. Each bank consists of two (2) filter stages in series, each stage consisting of two (2) filters. The blower provides the motive force for the effluent. After the blower, the effluent is discharged to the main stack.

1.2 Ventilation Air System Process and Control Description

The ventilation air system is comprised of ventilation air from CPP-601, 602, 604, 640, and 1618. This air is used to heat, ventilate, and to provide contamination control for the above facilities. This air, which comprises the bulk of the flow to the main stack, passes through the Ventilation Atmospheric Protection System (VAPS). This gas cleanup system consists of a fiberglass bed prefilter, HEPA filters arranged in twenty-six (26) parallel banks of four (4) filters; and three (3) blowers; two (2) of which normally operate. The blowers provide the motive force for the system and exhaust the air to the main stack.

1.3 Off-Gas Process and Control Description

The flow from Process Atmospheric Protection System (PAPS) is exhausted to the main stack. The PAPS flow is comprised of three (3) off-gas systems: the dissolver off-gas (DOG), the vessel off-gas (VOG), and the waste calcining off-gas. The PAPS system consists of a demister, superheater, and a single stage of three (3) parallel HEPA filters. From the PAPS, the off-gas is exhausted to the main stack.

The flow in the DOG system is comprised of off-gas from fuel processing facilities in CPP-601 and the Rare Gas Plant in CPP-604. These facilities are not being operated due to the current mission. The vacuum

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PERMIT TO CONSTRUCT
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 INEEL/INTEC
 Idaho Falls, Idaho

PERMIT NUMBER

0 2 3 - 0 0 0 0 1

SOURCE

B. LET&D, Ventilation Air System, and Process Off-Gas System

provided by the DOG system is used for contamination control. The DOG system consists of a mist eliminator, a superheater, a single stage of non-HEPA filters, and a blower. The blower effluent is discharged to the PAPS and then the main stack.

The flow in the VOG system is comprised of off-gas from the High-Level Liquid Waste (HLLW) Tank Farm (eleven [11] large waste tanks and numerous other small tanks, valve boxes, etc.), the PEW evaporator, fuel processing facilities in CPP-601 and the Pilot Plants in CPP-620 and 637. The system provides vacuum and contamination control to vessels in the connected facilities. The VOG system consists of a mist eliminator, a superheater, and a HEPA filter. In past practice, the Pilot Plant off-gasses were always combined with CPP-601 off-gas prior to passing through the VOG system. In the future, the 620/637 Pilot Plants will also have the capability of exhausting off-gas directly to the main stack after local HEPA filtration.

The flow in the NWCF and WCF Process Off-gas system (POG) is comprised of off-gas from the NWCF and WCF. The NWCF and the WCF were built to reduce HLLW to a smaller volume and more stable solid form known as calcine. The NWCF replaced the WCF and is the only active calciner.

High Level Liquid Waste from the Tank Farm is solidified in a fluidized-bed calciner at about 500 degrees Celsius using liquid fuel (typically kerosene) and oxygen to produce heat. The off-gas from the calciner vessel is cleaned by a high-efficiency cyclone, liquid scrub system, and four (4) parallel banks of HEPA filters. One (1) or two (2) of the HEPA filter banks are on-line during operation. Each filter bank is made up of three (3) stages, each with two (2) HEPA filters. Each filter bank provides the removal efficiency equivalent to two (2) stages of HEPA filtration at 99.97% each, during test conditions.

The calcined waste produced at the NWCF is transported by a pneumatic system to the Calcined Solids Storage Bins. The air used to transport the calcine is vented back through the NWCF and is discharged to the main stack. There are currently five (5) sets of filled bins. The sixth bin set is being filled and the seventh is being prepared for service. Each bin set consists of stainless steel bins inside a concrete vault. Bin sets 1, 2, and 3 are ventilated through the PAPS via the WCF off-gas line. Bin sets 4, 5, 6, and 7 have pressure relief systems which relieve through filters to the atmosphere when they are isolated from the NWCF calcine transfer system.

1.4 Pollution Control Equipment Listing

- 1.4.1 LET&D Mist eliminators (2 parallel trains)
- 1.4.2 LET&D HEPA filtration (2 banks)
- 1.4.3 VAPS Glass fiber bed filtration
- 1.4.4 VAPS HEPA filtration (26 banks)
- 1.4.5 PAPS Mist eliminator
- 1.4.6 PAPS HEPA filtration (1 stage of 3 filters)
- 1.4.7 DOG Mist eliminator
- 1.4.8 DOG Non-HEPA filtration

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INEEL/INTEC
Idaho Falls, Idaho

PERMIT NUMBER

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SOURCE

B. LET&D, Ventilation Air System, and Process Off-Gas System

- 1.4.9 VOG Mist eliminator
- 1.4.10 VOG HEPA filtration (1 filter)
- 1.4.11 NWCF High efficiency cyclone
- 1.4.12 NWCF Wet scrubber system
- 1.4.13 NWCF HEPA filtration (4 banks)
- 1.4.16 Bin Sets 4, 5, 6, and 7 Non-HEPA Filtration (1 or 2 filters)

1.5 Main Stack Specification

The Main Stack (CPP-708) has the following specifications:

Stack Height	-	250.0 feet
Stack Diameter	-	6.5 feet
Flow Rate	-	119,000 acfm (actual cubic feet per minute)

2. EMISSION LIMITS

2.1 Nitrogen Oxide (NO_x) Emission Limits

NO_x emissions shall not exceed four hundred seventy-two pounds per hour (472 lb/hr), as determined by the in-stack continuous emission monitoring system (CEMS), by approved U.S. EPA Reference Methods or approved alternative. Because the NWCF is the only substantial contributor of NO_x emissions to the main stack, continuous emission monitoring for NO_x is required only when the NWCF is operating. Annual NO_x emissions shall not exceed seventeen hundred tons per year (1700 T/yr), as determined by summing the actual hourly emissions as shown by the CEMS and the results of any other emissions estimation methods that were used.

2.2 Radionuclide Emissions Limits

Emissions of radionuclides from the main stack shall not, by themselves, or in combination with emissions from other INEEL sources, exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent in excess of ten (10) millirem per year, in accordance with 40 CFR 61, Subpart H. Doses due to radon-220 and radon-222, and their respective decay products, are excluded from this limit.

3. OPERATING REQUIREMENTS

3.1 Radionuclide Requirements

The permittee shall maintain and operate instrumentation in accordance with 40 CFR 61, Subpart H, to verify proper operation of the air pollution control equipment installed and ensure the limits in Section 2.2 are met.

DATE: October 18, 1999

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 Idaho Falls, Idaho

PERMIT NUMBER

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SOURCE

B. LET&D, Ventilation Air System, and Process Off-Gas System

3.2 HEPA Filter Requirements

The permittee shall install, operate, and maintain HEPA filter stages for the VAPS, PAPS, and NWCF having a minimum particle removal efficiency of no less than 99.97%. The permittee shall maintain and operate instrumentation to measure the pressure drop across the filter stages. HEPA filter efficiency shall be tested after installation and on an annual basis according to the ANSI N510 testing standard. All HEPA filters must be pretested and certified prior to installation and meet the government performance specification and overpressure and rough-handling requirements per MIL-F-51068. The permittee shall maintain written procedures in place which specify the conditions which require change out of the filters.

4. MONITORING REQUIREMENTS

4.1 CEMS Monitoring

The permittee shall maintain and operate an in-stack CEMS (continuous emissions monitor system) for the measurement of nitrogen oxides and gas flow rate at the main stack. The CEMS is required to be operated only while the NWCF is operating. The CEMS shall meet the requirements specified in 40 CFR 60, Appendix B. The permittee will maintain documentation which describes quality assurance procedures and maintenance procedures.

4.2 Radionuclide Monitoring

The permittee shall perform radionuclide sampling and dose calculations in accordance with 40 CFR 61, Subpart H. Effective dose equivalents to members of the public shall be calculated using EPA-approved sampling procedures and EPA model CAP-88PC or other EPA-approved models.

4.3 HEPA Filter Monitoring

The permittee shall monitor the pressure drop across the HEPA filter stages.

4.4 Scrubber Monitoring

The permittee shall monitor the water flow rate and the pressure drop across all scrubbers.

5. REPORTING REQUIREMENTS

The permittee shall submit an annual report by July 1 that provides the results of dose calculations based on collected INEEL emissions during the preceding calendar year (January 1 to December 31).

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PERMIT TO CONSTRUCT PERMITTEE, PROJECT, AND LOCATION	PERMIT NUMBER									
U.S. Department of Energy INEEL/INTEC Idaho Falls, Idaho	<table border="1" style="margin: auto;"> <tr> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">2</td> <td style="padding: 2px 5px;">3</td> <td style="padding: 2px 5px;">-</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">1</td> </tr> </table>	0	2	3	-	0	0	0	0	1
0	2	3	-	0	0	0	0	1		
SOURCE										
C. INEEL-wide No _x Sources										

1. SOURCE DESCRIPTION

1.1 Project Description

This permit was originally issued on 5/20/88 and addressed the increased throughput capacity and air emissions associated with the Fuel Processing Restoration (FPR) project. This project was cancelled and the permit has been modified to remove the sections that were no longer applicable.

The facilities listed under this source heading with their corresponding NO_x short-term and long-term emission limits are located throughout the INEEL. The top portion of the INEEL site (approximately divided at the 43 degree, 45 minute latitude) was separated from this project mainly for modeling purposes. Although the Test Area North facility was included in the inventory of existing sources submitted in the original application, it was later excluded from modeling and will not be listed in this permit.

1.2 Facility and Acronym Listing

1.2.1	Idaho Nuclear Technology and Engineering Center	INTEC
1.2.2	Coal Fired Steam Generating Facility	CFSGF
1.2.3	Argonne National Laboratory	ANL
1.2.4	Auxiliary Reactor Area	ARA
1.2.5	Central Facilities Area	CFA
1.2.6	Naval Reactor Facility	NRF
1.2.7	Power Burst Facility Area	PBF
1.2.8	Test Reactor Area	TRA
1.2.9	Waste Management Operations	WMO
1.2.10	Radioactive Waste Management Complex	RWMC

2. EMISSION LIMITS

NO_x emissions from all INEELwide NO_x sources shall not exceed their corresponding pound-per-hour (lb/hr) or tons-per-year (T/yr) emission limits listed in Appendix A.

3. MONITORING REQUIREMENTS

The permittee shall operate and maintain an ambient monitoring network for the measurement of NO_x. The monitor(s) shall be operated as specified in Title 40, Parts 50 and 58 of the Code of Federal Regulations. For specific methods and quality control, follow EPA's "Quality Assurance Handbook for Air Pollution Measurement Systems." The permittee will maintain a monitoring plan subject to DEQ approval, which describes the installation (dates), quality assurance, and maintenance procedures.

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PERMIT TO CONSTRUCT
PERMITTEE, PROJECT, AND LOCATION

U.S. Department of Energy
 INEEL/INTEC
 Idaho Falls, Idaho

PERMIT NUMBER

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SOURCE

Appendix A

APPENDIX A

INEELwide Nitrogen Oxide Emission Limits
 in pounds per hour (lb/hr) and tons per year (T/yr)

SOURCE DESCRIPTION	NOx (lb/hr)	NOx (T/yr)
INTEC/B-601 (B&W boiler)	10.285	22.46
INTEC/B-602 (B&W boiler)	10.285	22.46
INTEC/B-604 (Murray boiler)	20.075	74.20
INTEC/B-605 (Cleaver Brooks boiler)	20.075	74.20
ANL/Boiler No. 1 (Keeler boiler)	3.36	14.72
ANL/Boiler No. 2 (Keeler boiler)	3.36	14.72
ANL/Boiler No. 3 (Keeler boiler)	3.36	14.72
ANL/Boiler No. 4 (Cleaver Brooks boiler)	3.74	14.72
CFA/CFA-650 B-25 (Cleaver Brooks boiler)	0.58	1.90
CFA/CFA-662 B-28 and B-35 (one stack)	0.96	3.14
CFA/CFA-668 B31 (Kewanee Scotch boiler)	0.046	0.15
CFA/CFA-671 B-33 and B-34 (one stack)	1.52	4.98
CFA/CFA-688 B-101 and B-102 (one stack)	2.32	7.21
NRF/Boiler No. 1 (Vogt boiler)	22.66	37.13
NRF/Boiler No. 2 (Vogt boiler)	22.66	37.13
NRF/Boiler No. 3 (Vogt boiler)	22.66	37.13
PBF/PBF-620-620 M-31 (Cyclotherm boiler)	0.24	0.79

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PERMIT TO CONSTRUCT GENERAL PROVISIONS

- A. All emissions authorized herein shall be consistent with the terms and conditions of this permit and the *Rules for the Control of Air Pollution in Idaho*. The emission of any pollutant in excess of the limitations specified herein, or noncompliance with any other condition or limitation contained in this permit, shall constitute a violation of this permit and the *Rules for the Control of Air Pollution in Idaho*, and the Environmental Protection and Health Act, Idaho Code 39-101, et seq.
- B. The Permittee shall at all times (except as provided in the *Rules for the Control of Air Pollution in Idaho*) maintain in good working order and operate as efficiently as practicable, all treatment or control facilities or systems installed or used to achieve compliance with the terms and conditions of this permit and other applicable Idaho laws for the control of air pollution.
- C. The Permittee shall allow the Director, and/or the authorized representative(s), upon the presentation of credentials:
1. To enter at reasonable times upon the premises where an emission source is located, or in which any records are required to be kept under the terms and conditions of this permit; and
 2. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit, to inspect any monitoring methods required in this permit, and require stack emission testing in conformance with IDAPA 16.01.01.157 when deemed appropriate by the Director.
- D. Nothing in this permit is intended to relieve or exempt the Permittee from compliance with any applicable federal, state, or local law or regulation, except as specifically provided herein.
- E. The Permittee shall notify DEQ, in writing, of the required information for the following events within five (5) working days after occurrence:
1. Initiation of Construction - Date
 2. Completion/Cessation of Construction - Date
 3. Actual Production Startup - Date
 4. Initial Date of Achieving Maximum Production Rate - Production Rate and Date
- F. If emission testing is specified, the Permittee must schedule such testing within sixty (60) days after achieving the maximum production rate, but not later than one hundred and eighty (180) days after initial startup. Such testing must **strictly** adhere to the procedures outlined in IDAPA 16.01.01.157 and shall not be conducted on weekends or state holidays without prior written DEQ approval. Testing procedures and specific time limitations may be modified by DEQ by prior negotiation if conditions warrant adjustment. DEQ shall be notified at least fifteen (15) days prior to the scheduled compliance test. Any records or data generated as a result of such compliance test shall be made available to DEQ upon request.
- The maximum allowable operating rate shall be limited to 120% of the average operating rate attained during any performance test period, for which a test protocol has been granted prior approval by DEQ, unless (1) the test demonstrates noncompliance, (2) a more restrictive operating limit is specified elsewhere in this permit, or (3) at such an operating rate, emissions would exceed any emission limit(s) set forth in this permit.
- G. The provisions of this permit are severable, and if any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

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